

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

WITH SUPPLEMENT. } PRICE ..... SIXPENCE.  
PER ANNUM. BY POST. £1 4s.

THOMAS THOMPSON, JUN., 1, PALMERSTON BUILDINGS, BISHOPSGATE STREET, LONDON, E.C.

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**STOCK.**—HAYWARD TYLER AND CO., of LONDON, have now ready ENGINES, BOILERS, and "UNIVERSAL" STEAM PUMPS.

Now ready ENGINES, BOILERS, and "UNIVERSAL" STEAM PUMP having made extensive alterations in their premises to enable them to keep stock.



## Royal School of Mines.

## PROF. SMYTH'S LECTURES ON MINING—No. XXXIII.

[BY OUR SPECIAL REPORTER.]

When metallic tubing is put in the air rising through the upcast shaft often contains many substances which are apt to corrode iron. The iron then becomes so soft that in some cases you can easily cut it out with a knife, and hence it is incapable of resisting any serious pressure, and several accidents have occurred where the repairs have not been carefully attended to. Various varnishes, &c., have been tried for the purpose of protecting it; most of them are open to objection of one sort or other. Especially this, that if you conceal the whole face of the material you cannot see how it is getting on. A lining of wood has been put in in places where wood is not likely to be injured, in other cases a lining of thin bricks has been introduced, apparently with much success.

Of late years much time has been gained and economy introduced by not being obliged to wait till such time as you get down from the surface to a firm foundation, but by putting in intermediate wedging curbs at different places, and building up from one of them to the other. In some of these cases, where you have unusually large quantities of water, it may be that even an enormous array of steam-engines will not suffice to clear the water, and enable the men to get down to put in the tubing. Under these circumstances many methods have been introduced, especially during the present century. When cast-iron began to come into use a method was introduced for the lining of wells with it, and the process only needed to be enlarged to render it applicable to shafts. A ring of cast-iron is weighted down and pressed into the ground; on it is placed a second ring, and a joint made between them by means of flanges and bolts with lead, or gutta percha, or other material between; the weighting down is continued, then a third ring is superimposed, and so on. For the purpose of making them sink more readily a process of digging may be carried on at the same time, if the sand or material is tolerably free from water, but if there is much water the material is drawn up by a process known as bagging. The lowest ring is sharpened to enable it to penetrate better, and as soon as this comes into firm ground the water can be pumped out, and the shaft proceeded with in the ordinary manner. Many of the wells about London have been protected in this manner, and in some of the mining districts it has been adopted on a large scale. The large circular piers of the new Blackfriars Bridge, tubes of cast-iron, 15 ft. diameter, were placed in a similar manner: one of these was dropped to the bottom of the river, a second imposed on it, and the joints made by the assistance of divers, successive rings were added, till at last a tower, 60 or 70 ft., was built up, which was sunk till it reached a firm foundation. Another slight modification of this method consists in having an outer margin let down in this manner, then inside of it having another set of rings, to be supported in the ordinary way by curbs, &c. In the neighbourhood of a river within the area of its former extension, when you come down to the gravels and boulders, which are apt to be found there, the sharp edges of the lower ring may be broken or bent, or what is worse still, the whole structure may be canted or turned aside, and one or two cases of failure have occurred where the tubing was so canted that it could not be put right again. If not too low down this quicksand could be first secured by plank tubing, to avoid the risk referred to. In some cases these have been made of wrought-iron, but then the shaft has been generally made as one continuous tube, built up in lifts like a boiler. In these cases, of course, the strength of the metal will have to be proportioned to the pressure it is intended to resist; cast-iron is so much used on account of its enormous strength, combined with its cheapness. In Silesia some years ago the method was successfully adopted of sinking towers of masonry in this manner. A wooden curb, resting on a piece of iron with a cutting edge, formed the base, then on it a pile of masonry, 4 to 6 ft. high, was built, and crowned by a wooden curb; this constituted one set. The various curbs were strung together by iron rods. At the commencement a small space was excavated, and one of these sets placed in and sunk by the pressure of weights, and as it sunk down another set was built on its top, and the two secured by the tie rods. The sinking is generally assisted by men digging out the material from the interior. The great towers on the opposite side of the river, as approaches to the footway of the Thames Tunnel, were sunk in a similar manner to the first described, only on a larger scale, and with more brickwork. Solid walls of masonry on a base of iron which had a cutting edge were held together by means of tie rods; these shafts were 60 ft. diameter and 40 ft. high. The smallest deviation from the vertical would have been troublesome, to say the least, but the sinking was assisted by men digging at the bottom at opposite ends or diameters; or if the ground was harder in one portion, that portion might be excavated. In some instances the hydraulic press has been employed with advantage for forcing down the masonry.

The most novel introduction into the system of sinking in this manner is that brought forward by a colliery engineer, Mr. Friger. He was engaged in sinking some pits in the basin of the River Loire, and in sinking through the alluvial matter formerly deposited by the river he found that it was not at the surface that the sand was saturated with water, but at a depth of 60 or 70 ft. near the bottom of the alluvium, and that when once this was got through the sinking was comparatively easy. The upper part could be tubed by means of a lining, generally of sheet-iron at first; but the tubing could not be forced down, as in the method of pile driving. It suddenly struck him that if the atmospheric pressure was forcing the water into the tub from below, if he introduced a greater pressure into the top the water could be kept back; but the difficulty was to get the men in and out with the materials which they excavated. He effected this, however, by putting an inner tube inside the outer, making it water-tight above and below by means of a stuffing-box. This tube has a floor at bottom, with an opening large enough for a man to pass through; the roof is similarly provided, so that the tube is divided into three compartments. In passing to the lower or working compartment, or in removing the materials, one of the two doors of the middle compartment is always kept closed, so as to avoid as much as possible the loss of the compressed air. At first it was suggested that it would be incompatible with the men working for a certain number of hours, and it came before the French Academy of Sciences as a question of physics and hygiene. General pressure maintained is 2 to 3 atmospheres, but it has been worked up to as much as 4½. A pipe passing from the lower part to the surface serves for the escape of the water. In one case when they had got down to a depth of 80 ft. they could get no further, the water would not rise in the pipe; but then one of the men, making a clumsy blow, hit the pipe, and the water instantly rushed up; in fact, the weight of the column of water was lightened, and they found that by carefully managing the column they could get down to much greater depths. It was said at the time that there was a great loss of life attending the method, and for some time its application in Belgium and Prussia was checked; this, and the serious accidents which the men sometimes met with, show that it cannot be used without great precautions. Amongst other things, it was found that men of unsteady habits suffered far the most seriously from the compressed air; the thoughtlessness of the men, too, in rushing rapidly from the lower chamber to the upper, or vice versa, instead of staying a short time in the intermediate chamber, caused them great risk. The candles burnt very rapidly, and with much smoke in the air, causing great difficulty. And another source of accident has been found in the fact that if a powerful blast of compressed air is sent in the whole tube might be blown out, so that now it is commonly the practice to weight the upper part well.

The tract of country which lies between the coast at Calais and the Westphalian hills is very remarkable in respect of the great extension of the soft measures, which have been referred to in a previous lecture. In the district of Mons many difficulties have been met with, and overcome by the methods already described, while in other cases the engineers have been entirely vanquished. It was under these circumstances that a famous bore-master, G.

Kind, about 1850, suggested the idea of boring the shafts down from the surface, like ordinary bore-holes. Several shafts were commenced, from 4 to 5 ft. diameter, especially in cases where they had to be put down through alluvium, and where the lining was dropped down by degrees, without stopping to take out the water, with the intention of putting down tubing when a water-tight joint had in this way been established, and the whole made permanent. But what with pebbles often occurring, and the difficulty of establishing a perfectly water-tight joint, these attempts were not successful. The lecturer did not think the plan would have become a success but for the method of tubing invented by Mr. Chaudron, who joined Mr. Kind. In 1862 Mr. Chaudron exhibited a plan of his method of excluding water, but in spite of its being eloquently recommended it attracted little attention from the engineers. A few years later it was applied, and the reports were so satisfactory that the lecturer went over to Belgium to see it in operation, and found the method was quite a success, and was carried out far cheaper than the other methods. [A full description of it by Prof. Smyth is published in the Transactions of the Northern Institute of Mining Engineers, 1871.] It is certainly a method which in cases of special difficulty it would be advisable to introduce. The shaft is bored by taking out a central part 4 or 5 ft. diameter; first keeping it on 40 or 50 ft. ahead, then the main shaft 10 or 15 ft. diameter, and in some cases there is a third stage from the surface down to near the watery strata, lined with brickwork. One advantage consists in the smaller number of men employed; there are the master borer and his assistant, who regulate the borer by means of a cross head standing on a stage above the shaft, an engineman and stoker. The cutter for the smaller hole is made of a mass of hammered iron; in the cutter itself the teeth are steel, and are set in sockets in the iron, so as to be replaced if anything goes wrong with them. In addition to the main cutter are two guides above it, which keep it vertical; one of these carries longitudinal the other horizontal cutters at each extremity; the whole apparatus weighs about 5 to 8 tons. As soon as this smaller hole is carried far enough, and the material withdrawn, the larger borer is used to work the larger bore hole; it has teeth, like the smaller, but set on an inclined plane, so as to cut the base of the shaft sloping towards the centre. A loop in the centre of the borer, which fits into the smaller shaft, serves a guide, and the pieces of material as they are cut roll down the slope into a kibb'e placed in the small shaft. A great deal of aptitude is required in the men and the fitting of the apparatus, as will be seen when we find the apparatus weighs no less than 16 tons. After the shaft has been carried down to a certain part comes the most important point—the lining. Where you have the water in the shaft, and consequently no pressure from the outside to force the material in, a shaft will stand which would not stand under the ordinary methods. When a firm foundation is reached new tools are introduced, for the purpose of smoothing the bed for receiving the contrivance which is to secure a water-tight joint. This consists of two rings, the lower flanges of which point outward, while the upper point inward, and are made so that the upper can slide at the back over the lower. A quantity of moss is placed in the outer ring of the lower piece, so that when the upper ring is forced down the moss is compressed, and fills up all the crevices. The rings above are flanged towards the interior, and strung together by rods, and the whole is lowered down by screws and strong iron rods. After that a quantity of concrete is poured down the back, which soon hardens, and so completely that when it has been necessary to remove a segment it has been found that the concrete had kept out the water completely. The tub is of extra strength, cast in entire segments, and put together at the surface (the joints being well leaded), and lowered, and sometimes as much as 140 metres have been thus put down before any of the water is taken out. When the water is staunch out it is a mere matter of pumping to remove that which is in the shaft; then the men go down and make the joint still more perfect by means of a wedging curb, and afterwards the shaft below can be tubed up to the moss box.

## VISIT TO WIGAN OF THE SOUTH WALES INSTITUTE OF ENGINEERS.

This Institute, the members of which comprise managers and responsible engineers of the coal and iron works in the wide spread district of South Wales, is at present on an excursion to Lancashire. The members arrived in Manchester on Monday evening, and started early on the following morning to visit some of the works in the Wigan district. About thirty gentlemen put in an appearance, and among them were the President of the Institute, Mr. James Brogden, one of the proprietors of Llynvi Tondy and Ogmogre Bwllfa Works; Mr. S. M. Wilkinson, of Powell's Duffryn; Mr. James Barrow, of Mr. W. P. James, of Dowlais Works; Mr. W. Davies, of the Ebbw Vale Company; Mr. J. T. Edmonds, of the Vipona Company; Mr. T. H. Denkin, of Oakfields Works; Mr. Harry Davies, Swansea; and Mr. Hart, Huxham, the secretary of the Institute. The object of the South Wales engineers in visiting Lancashire at the present time is of a thoroughly practical nature. As far as mechanical appliances go they admit the superiority of Lancashire and the North of England over South Wales, and as regards the management of the men, the apportionment of work, and, in fact, all that tends to economy in labour and production, they frankly confess that they have much to learn from their northern neighbours. Therefore when trade may be said to have reached an almost unparalleled state of depression, the South Wales Institute of Engineers pay Lancashire a visit for the purpose of taking a "wink," as the President said at the luncheon, from what they see at works of more modern construction than their own. The visitors were much impressed with the pumping and winding arrangements at the collieries in the Wigan district, and with the comparatively few people at work on the pit banks. In this respect in Wigan they are far in advance of the Welsh collieries, where in some cases as many as 50 persons may be seen regularly employed on the pit banks, at a great and unnecessary expense to the proprietors. While South Wales gives way before Lancashire as far as the utility of its machinery and the economical working of coal is concerned, it claims for itself a superior position in point of the quality of the coal produced; but being so far separated from each other the two districts cannot be said to come much into competition unless in respect to seaboard orders. The great manufacturing county of the North has many advantages over its southern neighbours, possessing, as it fortunately does, a large market at its own door, while in the South the coal proprietors have, to a very large extent, to depend upon foreign shipments, and upon the agricultural interest, which is greatly inferior as a source of demand to the manufactures carried on so extensively in Lancashire.

Fortunately the weather on Tuesday morning was everything that could be desired, and, if anything, was, perhaps, too hot for excursionists who had to hurry out from one engine-house to another, and from one pit to another all the day over. The exertion demanded for the due performance of this task was by no means agreeable to those individuals upon whom nature had been so lavish in its dispensation of physical proportions. However, with the aid of conveyances, locomotives, and the railway, a very large portion of ground was gone over in the course of the day. When the party reached the Ince Hall Coal and Cannel Company's collieries they were met by Mr. G. Gilroy, managing director of the company, Mr. J. Gerrard, Mr. Swift, and Mr. Baldwin, who conducted them over the works. After inspecting the colliery plans they went to the lower works and saw the coal washing apparatus, the coal screening, the pumping-engines, and the coke ovens. The Saw Mills and East Pits were then visited, where was seen the endless chain system of haulage. Leaving Ince Hall the excursionists proceeded to Rosebridge, and were shown through the colliery by Mr. J. Bryham, Mr. Ernest Seddon, and Mr. Robert Mawson. About half the party made the descent into the deep pit, and great admiration was expressed at the arrangements in force at the colliery. The engine screens and head gear were also inspected.

After partaking of refreshment the excursionists departed for the Wigan Coal and Iron Company's works, and were received by Mr. W. H. Hewlett, Mr. C. G. Jackson, and Mr. Hilton. Mr. Jackson and Mr. Grundy conducted the visitors over the extensive works of

the company. Starting from the central offices, they proceeded on four engines to Woodshaw pit, where they saw the fan, endless rope, haulage engine, and winding arrangements in operation. They then went to Marsh House coke ovens, and from there to the Crawford pits and the Moor pits to see the splendid compressing engines belonging to the company. Remounting the locomotives, the visitors went to the Aspull pumping pits, where is to be seen the largest 16 in. cylinder, pumping water from a depth of 170 yards. Reaching the Crawford pits, the party left for Wigan in conveyances which were awaiting them on the highway. In consequence of the shortness of the time at their disposal they were reluctantly compelled to forego the projected visit to the extensive blast-furnaces at Kirkless. This was to many of them a source of great disappointment. The members of the Institute, together with a few friends, including Mr. Gilroy, of Ince Hall; Mr. H. Hall, the Government Inspector of Mines for the district; Mr. J. Bryham, of Rose Bridge; Mr. J. Gerrard, of Ince Hall, subsequently had lunch at the Victoria Hotel, Wigan, under the presidency of Mr. Brogden, the President of the Institute.

At the conclusion of the lunch, the President said he was glad to see so many members of the South Wales Institute of Engineers present on that occasion—those with whom they were fellow-workers from day to day—and he hoped they had all profited some in those bad times for the purpose of taking a "wink" from their Lancashire friends, who deservedly got the credit of being in advance of South Wales in more ways than one. They had come to learn something from them. The members of the Institute had time to time some very interesting papers brought before them illustrative of many things they had seen that morning, but, however valuable those papers might be in some respects, there could be no doubt that the members derived far more good by a personal inspection of the things when in actual operation. There was one thing which they in South Wales could not arrive at, and that was the Wigan system of the management of the men and the apportionment of the work. In regard to the Wigan district and the North of England, the division of labour was more economically arranged than in South Wales. Therefore it was, he thought, advisable for the younger members to visit the district and see the system at work. He hoped they had learned a great deal, and that they should be able practically to apply the knowledge thus acquired. Their thanks were due to the gentlemen who had, at so much trouble and inconvenience to themselves, conducted them over their works, and had afforded them so readily the means of acquiring the necessary information. He concluded with proposing the "Coal and Iron Trade of the District," coupled with the name of Mr. Gilroy, who was connected with one of the largest concerns in the district.

Mr. GILROY, in responding, said he felt himself in a false position that day, because he was a guest where he ought to have been one of the hosts. It was all owing to the want of some little arrangement or organisation, or perhaps owing to a want of time, certainly not for the want of inclination of the coalowners of the district, that he represented the coalowners as a guest instead of as a host. He trusted the gentlemen from South Wales would not think anything of that. They must take that visit as a sort of reconnaissance to assist them in seeing the place to advantage the next time they made an excursion into the district. He was afraid their inspection of the collieries was for the want of time somewhat imperfect. As for learning anything, he very much doubted whether they had seen anything better than they had in South Wales, but had they had more time at their disposal they would have enjoyed it better. He could say that if within the course of two or three years they should decide to come to Wigan again they would meet with a different reception at their hands. Before sitting down he begged to propose the toast of the "South Wales Institute of Engineers," coupled with the name of the President. He believed the interests of the two districts were much in common. What they had to do was to produce the article at the cheapest possible price. He would say nothing about bad trade, for all of them knew as much about it as he did.

The President, in acknowledging the compliment, said he rather differed from Mr. Gilroy when he said he doubted whether they had learned anything that day. He could assure him they had learned something, and that their visit had not been thrown away, and that having once been to Wigan they would have no objection to come again. (Cheers.)

The visitors then went in conveyances to Pemberton Collieries, and inspected the engines for compressing the air down the pits, the large ventilating fan, which is 46 ft. by 15 ft., and the haulage, bank, and head-gear arrangements. Several descended into the Nine-foot Mine, and inspected the works. Mr. Humble, the manager, in the absence of Mr. Watkin, conducted the visitors through the works. Making their way to Pemberton Railway Station, the party left for Manchester with the 6.30 train, one and all expressing themselves highly satisfied with the result of their visit to this part of the Wigan coal field.

BRISTOL MINING SCHOOL.—QUARRY WORKINGS.—By the kind permission of Messrs. Randall and Saunders, the students of the Bristol Mining School were enabled to inspect the workings of the Ridge Quarries, Corsham, and to study the tools and machinery employed in getting the Bath stone, which is so extensively employed for building purposes. The bed of stone worked at these quarries is a member of the Bath or Great Oolite, is 16 ft. thick, and lies at from 80 to 100 feet below the surface. The stone is removed by the pillar and stall system, the overburden and surface being left undisturbed; communication with the surface is effected by a shaft inclined at 45°, the travelling road for the men being provided with well cut steps. The face of a heading is first attacked by holing in the stone immediately under the roof, and the men use their tools with marvellous rapidity and skill in effecting this operation. The stone having to be removed in large blocks, the holings, or as they are locally termed "jads," have to be cut horizontally from 4 to 7 feet in from the face, and to secure as little waste of stone as possible they must not be deeper vertically than 10 inches. The tools employed for this purpose are the jadding pick and jadding iron. The head of the pick measures 16 inches from tip to tip, and weighs from 5 to 7 lbs. It is set obliquely upon the helve, which varies in length from 3 to 5 feet, the shorter length being employed at the commencement, the latter towards the completion of the hole. The jadding iron is a long bar, with a steel chisel edge, employed to deepen those jads which have to be cut beyond the reach of the picks, and is made to act by being forcibly projected against the surface; it is also very serviceable as a lever. The ability to swing a pick having a helve 5 feet long, close under the roof into a jad 5 feet deep horizontally, and varying in vertical depth from 10 inches at the face to 4 inches at the end, with the velocity necessary to chip the rock, and with the requisite accuracy of aim, is only obtained by long practice. The bold delivery of the blows in rapid succession, and the peculiar rocking motion of the body in the recovery after the stroke attract the notice of visitors, and call forth their admiration of the skill of the workmen. The side or back cuts, which must be made before the block of stone can be removed from its bed, are effected by the use of the saws. Each stall has a powerful crane fixed in its face, block of stone is ready for removal a lewis bolt is fixed in its face, and the crane put into action. The surface of the block is then dressed with an axe by hand labour. It is now ready to be sent to the surface. This is easily accomplished, tramways being laid throughout the workings and along the inclined shaft. Horses are employed to yield the motive power underground, and one of Brown and May's 10-horse power portable engines is stationed at the surface, and turns the drum upon which the chain employed for hauling is coiled. The tramway is continued with a gentle gradient to the Great Western Railway, the force of gravity being the motive power utilised in the descent of the loaded trucks, horse power bringing back the empties and stores.

METALLIC PYROMETER.—A bar of copper is, according to the invention of Mr. A. F. HURT, of Paris, enclosed within a porcelain tube firmly fixed within the furnace. The end of the copper bar is rigidly







This arises from an improvement in the ley or standard of the metal in the present workings, as compared with the old mine.—2. The quantity of ore struck, and the force employed to produce this result numbered 1294 in the year just past, yet the quantity of metal obtained has improved results are various. The excavation is small in comparison with the former, and requires comparatively little labour to keep its timber and pumpwork in a state of efficiency. The existing arrangements for hauling and conveying the ore to the furnaces are simple, and the machinery has been substituted for hand labour in the latter. Only good ore has been quarried, whereas in 1867 some 45,000 tons of inferior ore were mined. The same quantity of quarried and brought to the surface, and by substituting dynamite for gunpowder more duty has been performed per man. The effect is seen in a diminished cost of some 50,000*l.*, and an increased profit of about the same amount.

The superintendent, Mr. J. N. Gordon, left England to resume his duties on April 10, and arrived at Morro Velho on May 15. His report on his return, after an absence of twelve months, is also an interesting one. It states that, during the absence of twelve months, is also an interesting one. It states that, during the absence of twelve months, is also an interesting one. It states that, during the absence of twelve months, is also an interesting one.

In England—

**STOCK EXCHANGE GENERAL MARKETS.**—Business has been confined within the narrowest limits. Notwithstanding the official explanation of the assassination of minister at Constantinople as the result of personal revenge, the possibility that untoward difficulty

MISCELLANEOUS.—Anglo-American and Direct United States have advanced upon freely circulated rumours of amalgamation or joint working arrangement.

Year ending	Produce.	Cost.	Profit.
February of March.	£.	£.	£.
1876	64,661	247,820	84,253
1875	40,616	144,076	6,814
1867	61,212	243,903	134,516
1856	75,717	284,717	124,778

From the figures given in the report some interesting and satisfactory facts are apparent on comparing the results of the past year and those of 1867 and 1856—1. The produce obtained in the year ending February 1867, was 40,616 tons, or 49.5 per cent. less than the produce obtained in March last. The proceeds in sterling were respectively 35,567 and 84,253 for the smaller quantity in 1867 for the larger

To pay—				
P. S. Nicolson and Co., Rio de Janeiro .....	3,342	8	8	
Other liabilities in Brazil .....	4,975	6	11	6,317 15 7

so rife amongst all classes of the community, especially during the summer months.

**HOLLOWAY'S PILLS AND OINTMENT.**—These twin remedies exercise, in a manner peculiar to themselves, such an effect on the liver and excretory organs of the body that the presence of inspissated bile, or any foreign effete, or morbid material in the stomach and bowels is rendered almost impossible. It is scarcely possible to over-estimate the benefit conferred on mankind by such results, for if the commencement of bilious disorders, and intestinal irritations, be removed of the existing cause would reduce to a minimum, if it did not altogether avert the superincumbence of typhoid and enteric fevers, which are in the present day so rife amongst all classes of the community, especially during the hot and rainy summer months.







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chine is applied to working of pumps, sewing machines, lathes, &c., as a substitute for manual or foot labour. It is not, of course, in any way intended to supersede steam, its object being to simplify and ease performance of labour of a light description. The battery will be described more fully in a future Journal.

\* With this week's Journal a SUPPLEMENTAL SHEET is given, which contains: Original Correspondence; Rock-Boring Machinery; Boring Machinery for Mines (G. Rickard); the Cleve Hill Colliery Company; the Channel Tunnel; Crown Dues; Dues—Cornish and Crown; Copper Discovery in Devonshire; the Tin Plate Trade; the Copper Standard (E. J. Barnard); Dressing Ores; New Consols; Pennerley Mining Company (E. Ash-Mining Improvements; New Consols; the Bassett Process; New Consols Management (A. T. James); Prospects in the Gwennap District—Unwrought Ground (C. Bawden); Cardiganshire Mines—New and Old—No. VII. (A. Francis); Cardiganshire Undermining; the Rookhope Mine, and its Management—Self-Oiling Pedestal for Mining Corves, Wagons, &c. (Illustrated)—Main's Apparatus for Ascertaining the Temperature of Hot Blast—Meetings of Almada and Tinto, and the terrible, Sweetland Creek, Pennerley, Bensberg, and Wheal Grenville Companies.

## The Mining Market: Prices of Metals, Ores, &c.

METAL MARKET—LONDON, JUNE 23, 1876.

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The SILVER HILL COPPER MINING COMPANY, with a capital of \$500,000, in shares of 11. each, has been formed to develop a piece of unexplored mining ground in the Gwennapp district, held for a period of 21 years, at 1-18th royalty, with 30% per annum minimum rental. The property is 500 fms. long and 300 fms. wide, embracing several large veins, some of which mineral has been extracted. It is now proposed to erect a 100-hp. vertical cylinder pumping engine to sink the shaft on the lode, and to enable the company to take away the ore gone down in the bottom. It is estimated that the surrounding mines have given the shareholders over 1,000,000 lbs. of copper. The whole of the capital, except \$300, for cost of leases, etc., will be paid in cash.

CAPTAIN ABSALOM FRANCIS  
MINING AGENT, ENGINEER, AND SURVEYOR

Monthly and Daily Price Lists issued.  
Bankers: Alliance Bank.



### Notices to Correspondents.

\* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt; it then forms an accumulating useful work of reference.

**MALLEABLE IRON PRICES.**—“N. N.”—A list of prices of malleable iron is published by Mr. Thos. Ellis, of the North British Ironworks, Coatbridge. It includes prices for flats, rounds, squares, convex, half circles, horseshoe, cable, rivet, plating, L angle, tee, and other kinds of iron, so that there will be no difficulty in making an estimate whatever kind of iron may be used.

**RAISING WATER.**—Can some correspondent inform me, through the Journal, the largest percentage of water that can be raised to the height of 12 ft. with a hydraulic ram with 2 ft. head of water; also what would be the dimensions and price of a ram to raise 10,000 gallons per hour? The ram can be placed 2 ft. below a pond with unlimited supply of water, and the water can flow off at that level. What is the difference between a ram and a water-pressure engine? If any difference, I should like to know price and dimensions of that also?—F. K. J.

**SPANISH IRON ORE.**—I would be much obliged if some correspondent could give me the names of any agents in London for good clean Spanish iron ore. There is a good demand for it at present, and I am prepared to place some.—R. A.

**SHARE DEALING.**—We never interfere in the sale or purchase of shares; neither do we recommend any particular mine for investment or speculation, or broker through whom business should be transacted. The addresses of most of the latter appear in our advertising columns.

**Received.**—“R. W.”: Some long letters on the subject have been published in the Journal—“J. T.”: We have no copies—“Y. Z.”—“M. C. E.”—“Shareholder”—“L. B.”—“B. S.” (Maidenhead)—“G. J. G.” (Ezragobridge): Next week—“M. E.”—“Shareholder” (Wheat Grenville)—“R. G.”: Next week.

## THE MINING JOURNAL,

Railway and Commercial Gazette.

LONDON, JUNE 24, 1876.

### COMPETITION, AND SHORT HOURS.

“Our manufacturers are beaten out of the field for contracts which a few years since would have been a certainty for them.” So writes a daily contemporary, discussing the success with which nations who, like ourselves, make iron and steel, and are able to sell it in preference to ourselves to certain of the old customers of Great Britain. In proof that this is so, the sale of 3000 tons of steel rails to Italy at 15s. per ton under the prices quoted by English makers, is cited. In the view of our authority the causes of this changed aspect of the trade are—(1) as the natural result of a period of inflation and over-production; (2) the enhanced cost of production of the raw material; (3) the keen rivalry of our foreign competitors. “There are, of course,” the writer in question goes on, “other reasons, but by far the most important and influential is that of the increased cost of production.” Since 1870 it may be fairly said that the actual increase in wages, &c., is equal to over 30 percent. About one-third of this is due to the incidence of the Mines Regulation Act, and another third to the reduction in the hours of labour from ten to nine hours per diem, and the consequently diminished output.

The whole case is not here stated. Alas, that it should be possible to say that worse remains to be said. Worse as to the extent of the competition with which the British iron and steel maker is now to meet, and worse as to the short hours which certain of our operatives will labour. Of a later date than Monday last, when the article which we have quoted was written, is the information that the Government of India has been offered steel rails by a firm in Belgium at prices lower than those at which the Germans have succeeded in getting the Italian order. M. PETIT is credited with having offered the Indian Government steel rails of excellent quality, in quantity 2950 tons, of a weight of 62 lbs. per yard, at 23s. 8d. c. per ton of 1000 kilogrammes (i.e., about 30 lbs. short of our English ton) delivered free on board at Calcutta; and also 2000 tons, of 26 kilogrammes per French metre, at 23s. 1d. c. per ton of 1000 kilogrammes. The lowest quotation here given for steel rails of “excellent quality,” and of 62 lbs. to 1 yard, is about 9s. 3s. per ton, delivered in Calcutta. We have ourselves quotations of 7s. 4s. in Liège, and for German rails (Krupp make) at 8s. 5s., f.o.b. at Rotterdam. We can, therefore, fully credit the statement here given as to the terms upon which such an order, from such a buyer, people in Belgium just now who are determined to get business will accept. They mean very keen competition—competition which, cheap though steel rails now are in this country, it would be ruinous for English steelmasters to attempt to beat.

If, however, the competition which rail-makers are suffering from continental makers is severe, severe likewise is the competition which our locomotive builders and other leading engineers are at the same time experiencing from the same quarters. It is communicated that the celebrated Creusot Works, in France, have succeeded in obtaining the contract for the supply of locomotives for the important colliery railway company of the Donetz, in Russia. Goods engines, it is explained, having six connected wheels, and weighing 30 tons each, with the tender, are to be supplied at a price equal to 1893s. 16s. 8d. each. Such a price we can quite believe is the lowest ever before taken for such work. The late Mons. SCHNEIDER made a contract many years ago for the delivery throughout 20 years of large quantities of the splendid Algerian iron ore which the Kirkcaldy Hall Company, of Wigan, are now importing, and with which they are making pig-iron of magnificent quality in one of their furnaces. The terms upon which Mons. SCHNEIDER made this contract were, as may be imagined, greatly to his advantage, and English ironmasters and machinists will learn, without great satisfaction, that the contract has only a share in the giving to the Creusot Works an advantage which has enabled them to distance all other competitors in the race for this, just now, very desirable order. The firm has abundance of coal close at hand, and plenty of cheap and good labour. More, both at Creusot and Liège those hours are being worked by the operatives which increases the disadvantage to which we referred when we said that the whole case had not been stated. The writer from whom we quoted in our opening set down nine hours as the shortest day which is being worked. Short as are these hours, and much reason as Messrs. BROWN (Sheffield) and others have to complain of them, our readers know well that even so low as eight hours are being worked at too many of our collieries. Not until we have a change in this respect can we reasonably look for the shaking off of competitors who are now gripping us so firmly.

### THE IRON AND COAL TRADES OF SOUTH WALES.

Those who would accord credit where credit is due will regard with satisfaction the steps which the Great Western Railway Company are now taking to retain its legitimate hold of the South Wales district. As the pioneers of railway enterprise in the Principality, much of the wonderful development of the South Wales coal basin, and the equally wonderful aggregation of populations consequent thereon, is justly due to the Great Western Company. The original South Wales line from Chepstow to Milford, the great arterial means of communication of the district, was carried out under the fostering care of the Great Western Company, and although for some years it was regarded and worked as an independent company, it soon became evident that the interests of the shareholders of both lines would be promoted by amalgamation, and since the consummation of that event the interests of the Great Western have been paramount in the district. For many years this company practically had a monopoly of the whole South Wales basin, and truth to say it did not then make any very strenuous efforts to develop its mineral resources, or to give the traders the full advantages of railway facilities. The South Wales district, however, was too rich a prize for any one company to retain undisputed possession of, and although the Great Western, by purchase and amalgamation with many of the collateral lines running into the heart of the great coal basin and seats of ironmaking, very materially improved their position, the Midland and the London and North-Western cast jealous eyes upon the coveted prize, and made strenuous efforts to obtain part of the

profits accruing from the rapidly increasing trade and commerce of the district.

For many years the three great companies named might have been regarded as skillful chess-players, every move being checked mated as far as possible, and the amount of money spent in the Parliamentary committee rooms must have been enormous. At length both rival companies obtained the desired “division of spoil,” and much of the district is now traversed by the three lines, and the iron and coal trades thus receive wonderful impetus. The Great Western, however, is still regarded as the principal means of communication, and has it in its power far more than either of the other companies to still further expand the resources of the district, for there is scarcely a spot throughout South Wales to which it has not access; and it is satisfactory to find that the directors seem alive to the importance of retaining their hold of the district, and to the responsibilities which rest upon them as the principal carriers. There is of course a temporary depression consequent upon the unparalleled stagnation of the staple trades, but the carriage of minerals and goods over the great trunk line of the Great Western system has so increased of late years as to have altogether outgrown the station accommodation provided for its minerals and goods. The directors have not hesitated in their duty. At most of the large towns and ports new stations are being built, which, whilst they will afford vastly better accommodation for passengers, will at the same time afford the necessary facilities for the rapid increase in the mineral and goods traffic which is springing up all around. At Cardiff, Swansea, Landore, Neath, Llanelly, and other places, new stations are in advanced stages of completion involving an expenditure of several scores of thousands of pounds. Neath will be made the principal depot for the heavy repairs of engines between Gloucester and Milford Haven, and large works for that purpose are in course of construction, whilst Swansea is to be the centre office for the whole staff of the South Wales division. Nor is this all, the Great Western Company are helping forward the development of the mineral resources in other directions.

The new docks at Briton Ferry owe much to the material assistance of the Great Western Company, whilst arrangements have just been completed with the Swansea Harbour Trustees, by which the Great Western Company guarantee to become holders of frontage wharfage in the new docks in Fabian's Bay to the extent of 5000s. per annum, which capitalised means a contribution to that scheme of between 80,000s. and 100,000s. Again, at Milford Haven the Great Western are alive to their interests, and are promoting dock extension, so that throughout the whole route this powerful company are taking important, and at the same time wise and discreet, steps to retain their supremacy in the South Wales district. The area of the South Wales coal basin is the largest in Great Britain, estimated at 640,000 acres, the seams differing in thickness from about 55 to 100 ft. and Mr. Hall, in a work which he published some few years since, stated that “if this supply had been drawn upon to its present extent from the days of Noah downward it would even still be unexhausted.” The South Wales coal basin has been regarded by some writers as the “backbone” of the Great Western Company, and unquestionably enormous sums are received from the carriage of minerals and coals, and it is, therefore, with much satisfaction that we find the board of directors taking the steps they now are to strengthen their hold of the district and expand its mineral resources, which are only yet in their infancy.

### THE SOUTH DURHAM COAL TRADE.

Not only is the South Durham coal trade the great industry of Durham, but it is the most productive of our coal fields, and one in which, probably, there are the greatest seeds of future development. It produced in the last year for which we have authentic returns fully one-seventh of the whole coal output of the United Kingdom—more than all Scotland, much more than Belgium, and it has become, in short, the most productive coal field in the world. It may not, therefore, be uninteresting to endeavour to discover its present position, and how far it has been affected by the general dullness in trade, and also by the local paralysis in the iron trade, on which it has to a considerable extent depended.

We may fairly take the production of coal in the South Durham district as in round numbers at 18,000,000 tons per annum, extracted, according to Hunt's “Mineral Statistics,” from 172 collieries, but the latter statement is vague, inasmuch as some of those returned as distinct collieries are, instead, conglomerates of coal pits, whilst in other cases each pit is distinctly named. Still, this statement is sufficient to give some idea of the extent of the great industry in South Durham. As the result of the intense demand for coal experienced within the last few years—up to, indeed, a year ago—there was a largely-increased development, new pits being sunk at vast costs, and arrangements being made for the re-working of others, and as the result an output of close upon 18,000,000 tons yearly was reached. It is difficult to state the destination of that immense output; in normal times a very large proportion is used as coal or coke at the rolling-mills and blast-furnaces of the Cleveland district; another large proportion, probably close upon 2,000,000 tons, is shipped from South Durham ports, and beyond the small amount used for colliery consumption, the rest is used for local manufactures for land sale, and a proportion is also sent out of the district. During that intense demand which we have named this distribution was affected, there being lessened shipments, and also it may be noted an increased make of coke. Now that a stagnation almost universal is known in the iron trade, locally and generally, the distribution is affected in the contrary direction, for there is a tendency to increased shipments of coal and coke at all the local ports, and an immeasurably smaller consumption of manufacturing coal, with, of course, a corresponding diminution in the production of the latter.

During the later months of last year the tendency was to increased dullness and depression in the coal trade, tempered only by the increased demand incident to household coals in that season, and as that state has continued during the first quarter of this year there was naturally a closing of some of the collieries producing chiefly manufacturing coal. The demand for this class of coal seems now to have reached its minimum; and although as the summer season advances there will be a further declension in the demand for household coal, it is the only the usual annual temporary cessation of enquiry. The effect of the South Yorkshire strike was beneficially felt in South Durham for all classes of coal—there was a certain amount of clearance of stocks and a temporary briskness which, though it has passed away, has naturally left results. At present the coke market is easier, for some of the secondary kinds of coke from the southern part of the district there is little demand, but as the number of furnaces in blast in the Cleveland district is only little less than in the briskest period of three or four years ago, and as their make is actually more, there is a good amount of coke locally used, whilst the demand from other districts is not much affected. Thus, when the increased export trade is considered, and when it is felt that the iron trade demand can scarcely further diminish, the belief gains ground that the coal trade has reached, so far as demand is concerned, its lowest depths. There are, it is well known, a good number of idle collieries, chiefly those producing manufacturing coal, and there is the dullness incident to the time of year in the household branch, but the collieries whose produce is shipped improve the average worked, which would otherwise be exceedingly small. And it must be confessed that there are considerable stocks of coal held in several parts of the district, so that the supply is easy. But the impending settlement of wages, which is inevitable, will contribute in some measure to an increased demand; and although it would be in vain to hope for anything even approaching briskness in the coal trade, when one of its largest consumers is under paralysis, it may not be too much to expect that when the flush of summer has passed away there will be felt a greater amount of animation in the coal trade, the heavy stocks will be lessened, and short time will be less frequent.

It may be noticed too, in passing, that in South Durham during this year there has been witnessed one of the adjustments of labour often seen. A few years ago there was a large amount of surplus labour from the lead mining dales absorbed in the coal mining districts, and now the conditions of the two industries being reversed

there has been a slight return to the present more promising industry, and possibly, owing to circumstances like this, there is not at times of depression in trade. Indeed, in one of the largest of the sub-districts it is a rarity to see an unemployed miner even now, and this in one where coke is comparatively little made, and the dependence is chiefly on household coal at, for it, the dullest period of the year, and whence only a small proportion is sent for export; and this, from personal observation, we know is not an exceptional case, so that it may be fairly concluded that it is not a state of things even partially prevails in the summer it must, at least, be extended when the demand arises with the passing away of the hot weather. To what extent, as a whole, South Durham may be benefited depends, however, chiefly on the condition of the largest consumers, and a removal, however partially, of the now enveloping it would benefit immediately the whole of the coal district adjacent. We have named the possibility of a strike in the Durham coal field, but as the miners are divided, as their best advisers are against a resort to that, and as the employers are united, and the state of trade warrants a reduction, there is little fear of any such being more than partial, and no probability of its being prolonged.

### NO MORE STRIKES.

We have on several occasions alluded in rather severe terms to the course taken by Mr. MACDONALD, Mr. HALLIDAY, and other prominent members of the great delegate and Trades Union fraternity in fomenting and promoting the well nigh endless strikes which have afflicted the industrial world of Great Britain during the last four troubled years. It is with some satisfaction—if not exactly with some pleasure—that we have observed that Mr. MACDONALD, at any rate, has become rather alarmed at the amount of mischief which has been done. Mr. MACDONALD has confessed that during a period of 30 years he has never known the iron trade reduced to such a deplorable condition, and on a recent occasion he emphatically counselled his delegate friends to have no more strikes. The labour war which has afflicted the iron trade of Great Britain since 1872 may thus be happily considered at an end. For the present the ironworkers of Great Britain have returned to their senses, and they are prepared to do a certain amount of docile labour for a comparatively reasonable remuneration. This is as it should be, and we sincerely congratulate both masters and men upon the fact that such a happy change should have taken place. Both masters and men have probably profited from the stern discipline of experience which they have had to sustain; the capitalists engaged in the iron trade have learnt that they must be content with moderate profits, the ironworkers have been taught by a series of irresistible facts that they must be content with reasonable wages. The happiest results may be anticipated from the return to reason which severe adversity has brought in its train. We shall be able now to produce railways and other iron upon comparatively cheap terms, and we have had a chance in consequence of recovering for our metallurgical products some at least of the outlets which they have lost.

Another circumstance which has come to our knowledge would appear to show that the power of the delegates over the miners and ironworkers has been materially reduced of late, if, indeed, it has not been utterly broken. One of the delegates has had his travelling allowance reduced. The delegate thus reduced in his surroundings is, we believe, no less a personage than the redoubtable Mr. HALLIDAY. In future, when the great man moves about from point to point in the British industrial world, he is only to be allowed his per diem for his personal remuneration and expenses, and he will have to travel third class. Reduced wages, and in many cases no wages at all, have thus clearly told very severely upon the Trades Unions. When so great a trades unionist as Mr. HALLIDAY has to travel third class, and to put up with a daily remuneration from which he cannot become very rich, we may depend upon it that the delegate fraternity is not by any means worshipped as it used to be. Even our old friend, the “Western Mail,” appears to have given up the once congenial task of reporting the glowing eloquence of Mr. HALLIDAY. Mr. HALLIDAY was once magnified in whole columns of close print, but now our Welsh contemporary condemns him with something like icy indifference to scanty and insignificant paragraphs. This is another sign that the work of strike development is just now at a great, and probably increasing, discount.

Mr. W. BROWN, the miners' agent for North Staffordshire, who has resigned his post in consequence of the disaffection of some of his clients at the course he has taken in reference to the recent drop in wages, addressed the first of a series of meetings he is holding prior to leaving the district, on Monday, at Goldenhill. He justified his conduct, and said he had never deceived them. He bid them when they engaged him he hated strikes, and he hated them now more than he did six years ago. It was computed that 2,000,000 tons of coal had been lost in the Barnsley district by the recent strike, and his experience had taught him that whenever a change was to be made in wages it was the wisest plan to meet a deputation of employers, talk the matter over in a calm and dispassionate manner, and make the best bargain they could. A general strike should never be entered into, and a partial strike should seldom be resorted to. It was just as possible to keep the tide from ebbing and flowing as it was for a Trades Union to rule the prices of coal and iron. At the end of the pits, a little over three years ago, slack was selling at 15s. a ton, but was now down to 3s. 9d. In 1873 No. 3 Cleveland pig-iron got up to 120s. a ton, and now could be bought at 45s. 6d. In the same year large contracts were entered into with railway companies to supply coal at 18s. a ton, but in the present month contracts had been entered into at 6s. per ton. A thousand other facts could be cited, if need be, but he had said enough. It was the duty of the miners to read the markets, and understand the state of trade. When a strike took place it was not so much a question of right that had to be settled, but a test as to which was the strongest side. There had been prolonged strikes to ward off reductions in wages, but in almost every instance the men had had to give way.

**THE BASSET PREMIUM FOR ROCK-DRILLS.**—In answer to many enquiries for the details of the conditions upon which the very handsome premium is offered by Mr. Basset, we are enabled to state that “the arrangements necessary to be made before competition can be invited for the proposed premium for a rock-borer suitable to Cornish mines are not yet completed. The committee of the Royal Cornwall Polytechnic Society will meet for the further consideration of the subject on Monday next, after which definite information respecting the matter will be given.” We are promised the earliest possible information, and no time shall be lost in publishing it.

**GOVERNMENT INSPECTION OF MINES.**—The reports of the Inspectors of Mines for 1875 have just been issued, and from a full abstract of them given in to-day's Journal it will be seen that they are less satisfactory than for several years past. The deaths in connection with colliery operations were 1244, or one for each 118,750 tons of mineral raised, against 1056 deaths, or one for each 133,251 tons of mineral raised in the preceding year. It appears that in the aggregate 535,845 persons were engaged during 1875 in and about the coal, fire-clay, ironstone, and shale mines. Of these 427,017 were employed underground, and 108,282 (of whom 6504 were females) employed above ground; thus showing, as compared with the respective numbers employed during the year 1874, a decrease of 2094—2585 males and 395 females. During the year reported on—1875—133,396,485 tons of coal, 1,932,294 tons of fire-clay, 12,018,594 tons of ironstone, and 442,940 tons of shale, &c., were produced in the mines classed under the Coal Mines Regulation Act, including a quantity of iron pyrites, &c., found in working these mines. Comparing the above quantities with the output of 1874, an increase is shown in coal of 6,716,377 tons; fire-clay, a decrease of 135,497 tons; ironstone, an increase also of 89,193 tons in the quantity of shale, &c., thus giving an augmented quantity of mineral raised in all these mines, except fire-clay. The number of males under 13 years of age employed underground in all the metalliferous mines in Great Britain and Ireland is but 137. There are but 354 girls under 13 (of



which 331 are in the western counties) employed above ground about 7100 women and girls employed, although the aggregate number of workpeople is 592,206. The abstracts showing the districts in which the men, women, and girls are employed will be published in next week's Journal.

**FOREIGN COMPETITION IN THE IRON MANUFACTURE.**—The Croisset Works in France have succeeded in obtaining the contract for the supply of locomotives for the important railway company of the Donets, in Russia. Good engines, having six connected wheels, and weighing 30 tons each with the tender, are to be supplied at a price equal to 1895/16s. 8d. our money each. This is the lowest quotation which has ever been made for a locomotive of this class. A yet more serious circumstance deserves the attention of English ironmasters. We hear from Belgium that M. Petit has tendered and offered to the Government of India steel rails of excellent quality, in quantity 2950 tons, of a weight of 62 lbs. per yard, at 225 frs. 82 cents per ton (about 30 lbs. short of our English ton), delivered free on board at Calcutta; and also 2000 tons of 25 kilogrammes per French metre, at 231 frs. 45 cents per ton of 1000 kilogrammes.

**GOVERNMENT IRONMAKING IN INDIA.**—A communication from India (May 20) supplies detailed information upon the latest phase of the Government experiments in the making of iron in that dependency. It points out that Mr. Walter Ness, in his third series of experiments, has been successful to a larger extent than before. Mr. Ness constructed a furnace containing two separate chambers, one for burning the coal, and the other for a prepared ore, consisting of lime, charcoal, and iron ore, which were all pulverised, and mixed together and formed into lumps. A bridge divided the two chambers, and an arrangement was made for a stream of air to come in between them and act as a blow-pipe, the combustion of the fuel being urged by compressed air. It was found that the high heating power observed in the first experiments could also be obtained in this manner; and by keeping the fuel and ore and the like separate a pure iron was produced ready for being rolled into rails at once. The Government of India have resolved to send working samples to some established works where a direct process is followed, in order that practical tests may be made, in the hope that iron manufacture with Indian raw materials may become a commercial success in India. The latest experiments made by Mr. Ness seem to indicate that such a result may be possible, but he does not appear to rely on the identical course he has taken being the one that should be followed. Indeed, he is careful to point out that it was a metallurgical experiment, in conducting which neither time nor consumption of fuel were regarded. The direct process may succeed, in spite of the waste of material and labour, for the manufacture as it is carried on in small native furnaces, of such articles as Damascus sword blades, for which fancy prices can be commanded; but it is doubtful whether it could be made equally successful in general work, where the cost would have to be economised to the same extent, at least, as in the present ordinary course followed in blast-furnaces.

**A NEW SILVER MINE IN JAPAN.**—From a native Japanese newspaper we learn that in the district of Fukushima a silver mine, owned by Mr. Godai Saisuke, of the famous Satsuma clan, is being worked very successfully by the aid of foreign machinery, and that large and fine buildings in the foreign style are being constructed there. The employees number about 1000 hands, and besides these many shopkeepers and traders have settled on the spot. There are also about 100 machinists engaged at the works.

**COAL MINING IN JAPAN.**—A Japan contemporary tells us that on April 23 the well-known Takashima Colliery, which has been before spoken of in this Journal, turned out from one pit 735 tons of coal. This is believed to be the largest output during one day at this mine, and the fact speaks well for the capabilities of the mine and the energy of its present manager. It certainly does seem strange that, with such an example before them, the Japanese Government should persist in throwing all the obstacles possible in the way of the development by foreigners of the mining industry of the country.

**THE PATENT LAWS.**—A deputation from the Associated Chambers of Commerce has waited upon the Attorney-General to explain the various amendments to the Patents for Inventions Bill suggested by Chambers of Commerce. The principal alterations deemed necessary are, in the first instance, a reduction of the fees necessary on taking out a patent; a limitation of the power of the examiners to be appointed, so that a patent could not be refused for its supposed frivolousness; the insertion of clauses for the retention of provisional specifications according to the existing law, and of some provision making it necessary for any foreigner to whom a patent is granted either to manufacture the article so patented in England, or to grant licences on reasonable conditions for the manufacture by other persons. It was suggested, also, that the word "patent" should only be used on articles during the time when they were actually protected by patents. The Attorney-General promised to give the suggestions his best consideration, and requested that he might be supplied with a paper containing the precise amendments then brought before him.

#### TRADE OF THE TYNE AND WEAR.

June 22.—The Steam Coal Trade continues good, the export demand having been very steady for some time, and most of the works in Northumberland have been well employed of late; some of the best brands of this coal have realised 13s. per ton. The demand for house and gas coal is, of course, moderate at this season. The Durham coalmasters are, generally speaking, in a much worse position than those north of the Tyne. There is good house coal produced in Durham, as also excellent steam coal, but a great portion of that raised in Durham is coking and manufacturing coal, and the demand for this, owing mainly to the dull state of the ironworks, is far from satisfactory. Although the coal trade has been considered bad during the past half-year, and especially during the first quarter (and this view is correct, looking at the employment at the respective collieries in both counties), yet the total shipments of coal at these ports was really large, and exceeded that during the first half of the year 1875. This shows clearly enough that under the influence of the coal famine production has been increased to an enormous extent. The quantity of best steam coal shipped has been during the period referred to large, and fair prices—at any rate prices that left some little profit—have been realised; this may be put at 12s. 6d., and for best house coal the price maintained has been similar. All other kinds of coal have been got rid of, when it was possible to do so, for what they would bring, and as much of this coal has been consigned for absolute sale to home and foreign ports it was not possible to make any, or at all events very small, profits.

The Durham miners, so far as the question has been discussed, are determined not to accept the reduction proposed by the masters, and they are also determined not to accept the offer made to them of arbitration. This decision was arrived at on Saturday, when the delegates met at Durham, and it was decided by a large majority, as we have stated. The question has now to be considered by the men themselves, and this is to be done by ballot. Balloting papers have been delivered to all the men, and they have now simply to decide for arbitration or a strike. That the latter suicidal course will be adopted there are grave fears, but wiser counsels may prevail when the time arrives for prompt decision.

There is little change in the Iron Trade. A large trade continues to be done in pig metal at very low rates; stocks are, however, accumulating in many cases. There is no change in the finished iron trade, the demand for bars being very dull, and for rails worse. The foundry trade is very dull, although some good orders have been received in the Tyne lately. An Hawks and Crawshaw's great works an order has been secured for very heavy bridge work. The engineering trade is uniformly extremely bad. The shipbuilding trade on the Wear is very bad, but on the Tyne a large amount of good work is in progress. This consists of gunboats, ocean steam-

ers, and tug boats of various sizes, some of them very large and powerful vessels.

At Middlesbrough, on Tuesday, the market was fairly attended, and there was rather a firmer feeling than has of late been the case. Makers do not appear to be inclined to give way, and the quotations of last week were pretty firmly sustained. The enquiry for fresh trade is limited, but there are good deliveries being made on current orders. Most of the leading makers are sold forward for the next month or two, and therefore are not anxious sellers. The quotations stand about—No. 1, 50s.; No. 3, 48s.; No. 4, 46s. 6d. to 44s. net cash. The manufactured iron trade is quiet, and the demand for rails, plates, &c., is very limited, though a great deal of work is still being turned out in plates. The bar trade is but irregular in regard to demand and employment, some of the mills working some time. The miscellaneous trade of the district is fairly engaged. General engineering establishments are generally slow. The prices of manufactured iron are—rails, 6d.; ship-plates, 7s. 6d. to 7s. 10d.; common bars, 6s. 6d. to 6s. 10d.; angle iron, 6s. 10d. to 7s.; puddled bars, 4s. 6d. to 4s. 10d.; 17s. 6d. The foundries are still very fully occupied, and most of them are pretty sure of a good summer's work. The Coal Trade shows no difference. Coke is steady at late rates, and prices slightly firmer in view of a possible rupture with the pitmen respecting the wages question. Best coke, 11s. to 12s. at the ovens.

#### REPORT FROM CORNWALL.

June 22.—Another very dull week, so far as all matters connected with mining or our metal trade is concerned, with no immediate prospect of improvement; and we must once more point out that while the general trade of the country continues in its present depressed state it is impossible that mining should be any better.

If only, however, we could believe in the golden visions of a gentleman who has recently honoured Cornwall by a visit, and who is not only said to be a thorough "dowsner," but a confirmed spiritualist into the bargain. He tells of wealth untold lying within easy reach beneath the rugged surface of our "rocky land of strangers;" wealth, the existence of which has been revealed to him by spirits, and of the actuality of which, therefore, he is quite certain. We have heard some very strange stories concerning this gentleman's discoveries. One is truly magnificent, for he states that only 100 ft. beneath the surface, and not 100 miles from Camborne, there is a mass of gold, the top of which is about 60 ft. square in area, and which is unknown in depth; and in what may be called our more legitimate mining operations—those connected with tin and copper—his insight is little less wonderful. He can tell of richer deposits than have ever yet been worked, and can in many cases go so far as to indicate their exact positions on the maps of the sets on which they occur; though in certain cases, when the adventures have not been all that they should be, his spirit informant forbids the secret to be revealed. The country, in fact, according to him, is full of subterranean riches almost from one end to the other. If only a tenth of a tithe of all this could be realised, what an El Dorado Cornwall would be.

To pass to a very gratifying matter of fact. This week has seen, after a long and arduous struggle with difficulties, the opening of the Cornwall Minerals Railway for passenger traffic. We believe this line, which crosses the country nearly midway, and unites the ports of Fowey, Par, and Newquay, has a great future before it, though the sanguine expectations held out when it started have not hitherto been realised. One of the chief items of anticipated traffic was that of iron ore from the mines at Perran, which have so long been under a cloud. Sooner or later, however, the mineral wealth of that district must be utilised, to the great gain of the Cornwall Minerals Railway, and we are glad to find that those interested in that undertaking are as sanguine as ever that blast-furnaces will be erected at Par. Meantime, though mining generally in Mid-Cornwall has been anything but prosperous of late, we are glad to find there is a prospect of revival, and that Capt. Cock intends to open up with vigour some of the sets, especially iron, which belong to him.

It must not be imagined that because the iron ore traffic has so far failed the Cornwall Minerals Company have been idle. Quite the contrary. They have done and are doing a very large business indeed in the carriage of china-clay. Their lines, including the Newquay and Cornwall Junction from Baragallow, completely intersect the great china-clay district of St. Stephen's, St. Dennis, and Roche, and the facilities thus afforded have led to the opening up of several new works, and to large extension of the output of many previously existing. By-and-bye we shall see these and other at present isolated lines in Cornwall connected with the great narrow-gauge system of the country.

There is already promise of an excellent exhibition in connection with the Royal Cornwall Polytechnic Society, which opens on September 5. The special premiums are very numerous, and include premiums for improvements in pump valves for use in mines; for complete sets of models or drawings of all the various pump valves and steam valves now or formerly used in connection with Cornish mines; for improved machines for dressing ores; for collections of ore and "country;" for improved methods of making commercially valuable ores or minerals raised from mines in Cornwall or Devon, now regarded as worthless (by the editor of the *Mining Journal*); for the most exact account of the phenomena of mineral veins in any mine or district (by Colonel Tremayne and the Society); for accurately drawn cross sections of Cornish mining districts; for the best means of preventing the influx of water into the boiler compartments of steam vessels; for the improvement of Cornish river fisheries (Mr. R. R. Broad and the Society); for the best illustrated journal of natural history and the best calendar of nature; and for the best harvest scene picture of "Crying the Neck." Special prizes are also given by Miss A. M. Fox (to school girls under fourteen for cutting out); and by Mr. C. Fox—the Lander prizes. The general prizes are of the same character as in former years, thoroughly polytechnic in their range and aim. A valuable collection has been promised from South Kensington.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

June 22.—The Iron Trade of this district is still without any appreciable improvement either in the pig or the finished departments. Even first-class firms who make only superior qualities of iron are not able to afford more than very partial employment to the majority of their workpeople. In some few cases makers of good iron, whose names are not prominent in the market, are moderately well employed, especially in the sheet mills. Prices, as a rule, have a tendency in favour of buyers. Hematite pigs, under the influence of competition, are easier at 75s. per ton short weight delivered. In the finished iron department good merchant sheets are offering at 9/ 10s. per ton. It is reported that notwithstanding the restricted make of pig-iron in the district stocks are increasing, and it is not improbable that still more furnaces will have to be put out of blast.

The South Staffordshire Coal Trade is very quiet, but prices are maintained in moderate steadiness, owing to the output being restricted in proportion to the demand. The change in the weather has affected the house coal trade of the Cannock Chase district.

A considerable fall has been experienced this week in the value of local mining and manufacturing companies' shares. We select the following from to-day's quotations on the Birmingham Stock Exchange:—Cannock and Huntington Colliery, 3/ 10s.; a fall of 1/ 10s.; Mid-Cannock, 5 prem., sellers, a fall of 1/ 10s.; Sandwell Park, 26s.; a fall of 1/ 10s.; Pelsall Coal and Iron, 6d. 10s.; a fall of 1/ 10s.; Patent Shaft and Axle, 3 prem.; a fall of 1/ 10s.; Chillington Iron, 3/ 10s.; John Bagnall and Sons, 5s.

A Wolverhampton correspondent writes:—The new Wages Board continues to broaden and strengthen, alike in numbers of firms and of men who are desirous of coming within its operation, and in the amount of funds which are reaching the treasurer. Amongst the most recent accessions from amongst the employers are firms of much distinction in the district, who at one time were a little reluctant to enter, though their men were members of the board. This more conspicuous unanimity of sentiment upon this important economical branch of the iron-making business is highly promising as to the future, as well as the present, relations between capital and labour in South Staffordshire. Mr. Mundella, M.P., who had possessed himself of a copy of the rules of the board, has written respecting them that they are "fair, just, and practical," and he has taken steps with a view to introducing a similar code into an iron-making district in another part of the kingdom.

The Iron Trade of North Staffordshire is better in the rail department, some tolerable railway contracts having recently been placed. Otherwise business is as dull as ever. Best boiler-plates are quoted 10/ 10s.; best plates, 10/ 10s.; crown bars, 8/ 10s.; ditto, medium brands, 8/ 10s. In the pig-iron trade there is very little doing.

Mr. T. E. Horton, late manager of the Lilleshall Company's collieries, has received a handsome souvenir of the esteem entertained for him by the chief officers of the Lilleshall Company. The testimonial consisted of a life-size portrait of Mrs. Horton, painted by Mr. Lewis Dickinson, and a richly engraved address, enclosed in an ebony and silver casket. Mrs. Horton at the same time was presented with a costly gold bracelet, set with emeralds and diamonds.

#### SOUTH STAFFORDSHIRE MINES DRAINAGE—FLOODING OF THE BILSTON MINES.

We have been requested to publish the following letter, which has been addressed to the Editor of the "Wolverhampton Chronicle":—

SIR,—The meaneast insect that we tread upon feels a pang as great as when a giant dies. If the Commissioners had dealt more fairly with what Mr. Groucutt calls "such coalmasters as these," or, as the *Mining Journal* says, "these people," the memorial under section 40 of the South Staffordshire Mines Drainage Act would not have been signed by the majority in ratable value, according to the poor rate of the owners and occupiers of mines in any drainage district; but to show the public how we are treated, I forward you the copy of a letter addressed to Messrs. Corser and Fowler, in answer to one from them threatening to detain upon us for the rate, which they afterwards did. How is it that persons who do not turn water on to their neighbours are not exempt from the rate? Mr. Groucutt says they are, and surely, being a Commissioner, he must know they are charged; and because they belong to the class, "such coalmasters as these," when they make any communication to the committee of the Bilston district, their letters are not even acknowledged.

We have not had sixpence spent on our colliery by the Drainage Commissioners, only so far as getting information, yet we are charged with 210/ 4s. 2d., of which we paid willingly last year 41/ 17s. 10d., expecting in time we should get some benefit; 41/ 6s. 7d. we have paid this year, under a distraint, and 123/ 10s. 9d. balance, for which we were threatened with further proceedings if it was not paid in the course of the week ending May 6. I am not so young as Mr. A. Hill—this vexes me—neither have I had the long experience of such gentlemen as Messrs. Groucutt and Woodhouse, the mining engineer to the South Staffordshire Mines Drainage, yet I was article to Mr. S. Bailey, a mining engineer of some note in South Staffordshire some twenty-five years ago, and venture to make the assertion that if the Commissioners had confined themselves to the surface drainage exclusively for some years to come, and left the mines drainage alone, as half the water-engines would not be required when the surface work was properly done, it would have been better for the whole of South Staffordshire, and especially for the Bilston district, with only five millions of tons left in it, and that quantity very much scattered and not in its maiden state.

In conclusion, I would inform the public that "such coalmasters as these" would be only too glad to pay the mines drainage rates if their collieries were freed from water, but as such is not likely to be the case, they see little difference whether they are drowned out or rated out.

DEAN, CASWELL.

[COPY OF LETTER.]  
Old Heath Colliery, Wolverhampton, March 15, 1875.  
DEAR SIRS,—In answer to your application of the 13th inst., we beg to inform you that the Mines Drainage Commissioners, not having done anything towards freeing us, we were flooded last year, although at the time we were raising 200,000 gallons of water in the 24 hours, and still remain flooded. (See letters to Mr. Smith, South Staffordshire Mines Drainage secretary, on the subject.) We are also threatened with an action in consequence of not being in a position to supply according to agreement. We paid last year's demand (41/ 17s. 10d.), and are willing to pay this if our water is taken, or are allowed *pro rata* for the quantity of water we raise in the district. We will leave the matter in the hands of an arbitrator appointed by the Board of Trade, or we will pay on the quantity of minerals we are capable of raising now that we are drowned out. H. and B. CASWELL.

To Messrs. Corser and Fowler.

#### REPORT FROM THE FOREST OF DEAN.

June 21.—Reports for some time past have been mostly of a discouraging nature, but as correspondents do not make commercial history, but write it from the evolutions of Providence, there is no help for the present state of things except to attend the path of duty, and wait and hope for better times. With the best of wishes for the working bees in all the hives of our industries in Great Britain at large, and in the Forest in particular, we cannot get quit of the conviction that much of the present depression of trade must be placed to the account of the frequent disputes between employers and employees. In saying so much we do not shut our eyes to the fact that the blame is not all due on one side. No; employers have sometimes been in the wrong, and sometimes the workmen, but the disputes and the disruptions themselves have been almost ruinous in breaking up trade connections, and in that way driving business away to other districts. Yes; and to other countries too, and that once effected will be seldom fully recovered. Once gone it is difficult to recover part of it back. Commercial men and manufacturers are not, as many working men seem to imagine, and indeed frequently assume, masters of markets, but are like other men to a large extent creatures of circumstances, and can only proceed in business according to the possibilities of the times; and as disputes have largely disorganised commercial affairs, it will be the best policy for working men and their employers to study what is possible and best under the circumstances; be considerate, moderate, and conciliatory, and not expect what is unreasonable or impossible on either side, which will be only mutual policy likely to recover lost trade, and bring back any good degree of prosperity. We regret to report another notice of a 5 per cent. reduction in the Forest of Dean, which was posted upon Tuesday, to the effect that on the 1st prox. The Buck shaftmen have submitted to the reduction proposed to them, and are working now without any percentage.

A new engine and new engine-house are about to be erected at Stokemantle, preparations being now already in progress, Mr. E. Crawshaw having visited the place for inspection and instructions on Tuesday. Some dissatisfaction has been created by the tactics of the Severn and Wye Railway Company having two or three times raised the hopes of the Cinderford people by announcing the intention of bringing their line and erecting a station at Bilson Green and then letting the matter drop. The erection of a station in close proximity to Cinderford is the only way of securing goods and passenger traffic to that place. The Drybrook Road Station is little better than a mockery for Cinderford people. The best thing for the Severn and Wye Company, and indeed for the Forest itself, would be what we suggested some time since—for it to sell to the Midland Company, and then cross Bilson Green, tunnel under Haywood, and out at Trow Ditch, via Guns Mills and Flaxley, to a junction with the Gloucester and Hereford line, about a mile on the Forest side of Grange Court junction, with running powers over that line to Gloucester to the Midland system. The company would then have a complete loop, or half-circle line from Berkeley Road, via Severn Bridge, Lydney, Parkend, Cinderford, and Grange Court to Gloucester. The Severn and Wye (or Midland, as the case should be) would not then have to complain of the want of patronage from Cinderford people.

#### REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

June 22.—There is again no report of an encouraging nature to be forwarded with regard to the staple trades of this district. Clearances of iron have during the last few days again fallen off. A shipment of rails has again taken place to Russia, but the news which comes from that quarter is by no means of a satisfactory nature. Government, it is stated, has adopted measures of a protective character, with a view of developing the home manufacture of iron, and when it is considered how much Welsh ironmasters, in the almost total loss of the Transatlantic demand, have depended upon Russian requirements, there is no doubt the blow will be a severe one to the district. The figures showing the exports of iron during the month of May this year bear favourable comparison with those of the previous month. The total for May amounts to 19,313 tons, against 13,751 tons in April, showing a gain of over 5000 tons. Of this quantity Cardiff cleared 11,239 tons, Newport 7771, and Swansea only 303 tons. Business in pigs shares in the prevailing depression, although this branch of the iron trade has not proportionately suffered to the same extent as the finished branches.

If any further proof of the low ebb to which the iron trade of the district has sunk were needed, it would be found in the report of the Elbow Vale Iron Company. Speaking plainly, the report for the year ending March 1st shows a loss during the twelve months of the enormous sum of 221,000/. The directors, it appears, have had under consideration the desirability of stopping the works or otherwise, as prices have declined to a degree which is almost unprecedented. The question was, therefore, whether the works should be entirely closed, or the concern carried on at a "certain and considerable" loss. The directors had chosen the latter alternative. Surely this must be taken as a lesson by the workmen, who must now see that if they resist reasonable reductions in wages the closing of works, and the consequent loss of wages to themselves, must be an inevitable result. To turn to the Tin Plate Trade, the depression which has so long prevailed shows no signs of passing away. At the Aberllynny Works the men have returned work at a reduction—in fact, in the present state of affairs the men must be foolish enough who think that the masters will give way to them in a matter of wages.

The demand for coals does not improve, and for steam and house qualities prices do not become higher. Business in house qualities certainly is very flat. During the month of May last the quantities of coal exported foreign were—from Newport, 44,933 tons, against 15,099 tons in the corresponding month of last year; Cardiff, 300,250 tons, against 155,308 tons; Swansea, 58,543 tons, against 44,734 tons; and Llanelly, 9473 tons, against 10,830 tons. In the same period Newport cleared 61,439 tons coastwise, against 37,115 tons; Cardiff, 85,542 tons, compared with 38,956 tons; Swansea, 27,175 tons, compared with 24,525 tons; and Llanelly, 15,572 tons, compared with 14,145 tons. It will be observed that these figures show a large increase over those of 1874, but bearing in mind that the great "strike" and lock-out was then in existence, they must not be taken as a fair basis of comparison. In May last the exports of pig metal were—from Swansea, 21,608 tons; Cardiff, 6118 tons; and Llanelly, 172 tons. These figures show but a very slight advance on those of the previous month.

Mr. W. T. Lewis, of the Mardy, has been elected by the debenture-holders in the Aberdare and Plymouth Iron Company as their representative on the Board of Control who manage the concern.

Another proof of the depression of trade is afforded by the fact that the Glis-











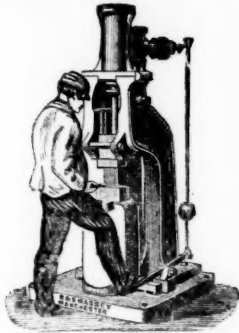
# B. & S. MASSEY, OPENSHAW, MANCHESTER.

Prize Medals—Paris, 1867; Havre, 1868; Highland Society, 1870; Liverpool, 1871; Moscow, 1872; Vienna, 1873; Scientific Industry Society, 1875; Leeds, 1875; Paris, 1876.

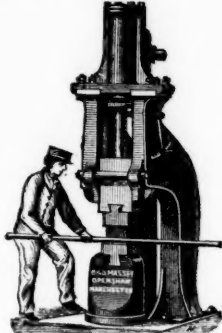
PATENTEES AND MAKERS OF DOUBLE AND SINGLE-ACTING

## STEAM HAMMERS

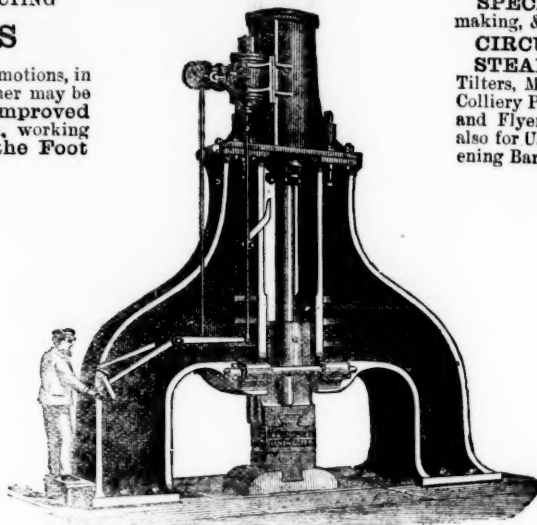
Of all sizes, from  $\frac{1}{2}$  cwt. to 20 tons, with self-acting or hand motions, in either case giving a perfectly DEAD BLOW, while the former may be worked by hand when desired. Large Hammers, with Improved Framing, in Cast or Wrought Iron. Small Hammers, working up to 500 blows per minute, in some cases being worked by the Foot of the Smith, and not requiring any separate Driver.



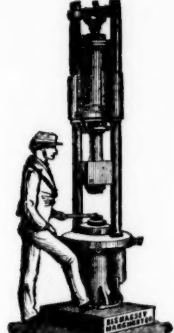
Small Hammer with Foot Motion.



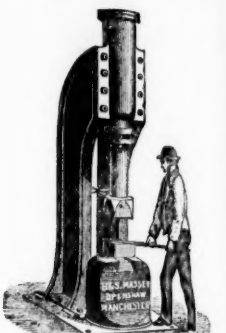
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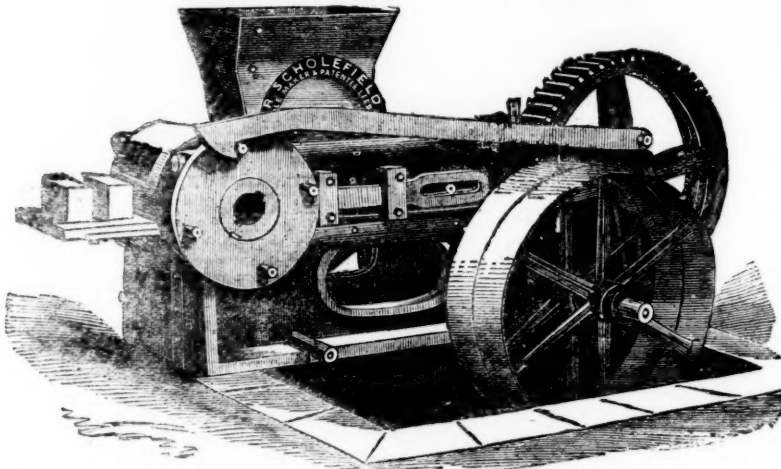
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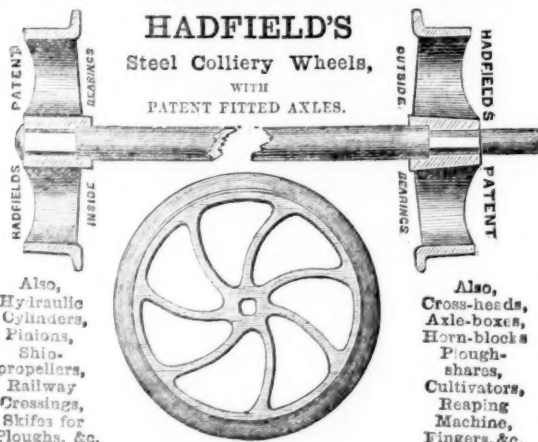
2 men digging, each 4s. per day .....	£0 8 0
1 man grinding, 4s. 6d. per day .....	0 4 6
1 boy taking off bricks from machine, and placing them in barrow ready for the kiln, 2s. per day .....	0 2 0
1 boy greasing, 1s. 6d. per day .....	0 1 6
1 engine-man, 5s. per day .....	0 1 0
1 man wheeling bricks from machine to kiln, 4s. per day .....	0 4 0
Total cost of making 10,000 pressed bricks .....	£1 5 0, or 2s. 6d. per 1000.

(SETTING AND BURNING SAME PRICE AS HAND-MADE BRICKS.)

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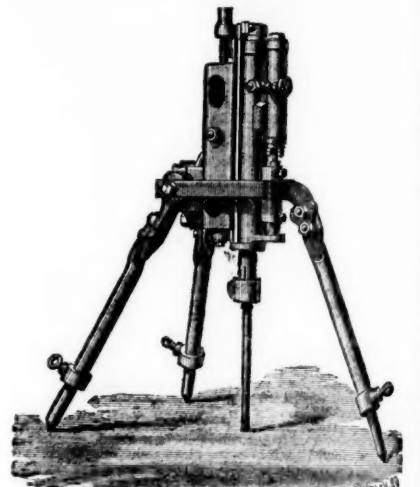


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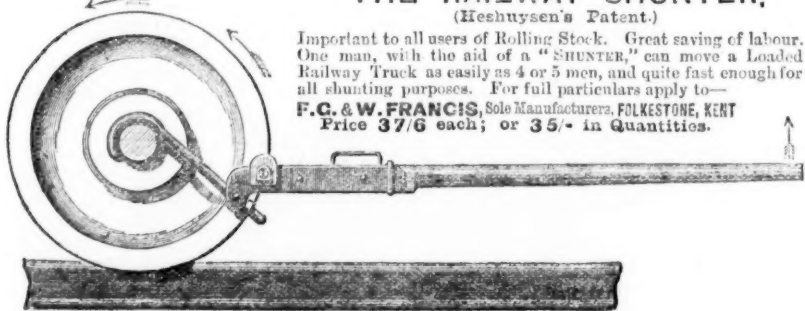
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AGENTS WANTED.



## THE MINING SHARE LIST.

## BRITISH DIVIDEND MINES.

Shares.	Mines.	Div.	Last wk.	Clos. Pr.	Total divs.	Per share.	Last paid.
1500	Alderley Edge, c, Cheshire*	1 0 0	—	—	12 11 8	0 5 0	Jan. 1876
15000	Balmuccia, c, Devon*	1 0 0	—	—	0 2 0	0 2 0	Nov. 1875
10000	Banfield, c, Devon*	1 0 0	—	—	0 2 0	0 2 0	June 1875
200	Bathwick, c, St. Just*	118 5 0	45	40 45	619 15 0	5 0 0	Aug. 1875
4000	Brookwood, c, Buckfastleigh	1 18 0	2	1 1/2 2	3 18 0	0 3 0	Nov. 1875
3848	Cargill, s, Newlyn*	6 2 0	—	—	4 18 3	0 12 6	Oct. 1875
4000	Cashwell, c, Cumberland*	2 10 0	—	—	1 7 6	0 2 0	Aug. 1875
1000	Carn Brea, c, t, Illogan*	35 0 0	38	36 38	3 8 0	0 3 0	Feb. 1875
5000	Cath. & Jane, c, Penryn & Wendron*	22 9 9	4	3 1/2 4	11 17 0	0 7 6	Jan. 1875
2450	Cook's Kitchen, c, Illogan*	1 10 0	4	2 1/2 3 1/2	116 10 0	0 12 0	May 1875
10240	Devon Gr. Consols, c, Tavistock*	10 14 10	37	35 36	109 18 0	0 7 6	May 1876
4298	Dolcoath, c, Camborne	6 0 0	—	—	0 2 0	0 2 0	July 1876
6500	Drake Walls, c, Calstock	1 0 0	—	—	0 3 0	0 3 0	Feb. 1876
15000	Duchess of Westminster, c, Holywell	1 0 0	—	—	0 3 0	0 3 0	Feb. 1876
10000	East Baleswidon, c, Sancreed*	1 0 0	—	—	14 19 0	0 2 0	Feb. 1876
6144	East Caradon, c, St. Cleer*	32 0 0	—	—	234 10 0	1 0 0	Oct. 1875
300	East Darren, c, Cardiganshire	0 9 9	13 1/2	13 13 1/2	14 12 3	0 2 1/2	May 1876
6000	East Pool, c, Illogan*	6 19 0	2 1/2	2 1/2	20 7 6	0 7 6	Oct. 1875
1906	East Wheel Lovell, c, Wendron*	25 0 0	—	—	82 5 0	0 10 0	Feb. 1876
2800	Foxdale, c, Isle of Man*	13 1/2	1 1 1/2	—	0 11 10	0 2 0	Jan. 1876
10000	Glasgow Carr, c, (30,000 £1 p. 10,000 15s. p.)	4 0 0	—	—	0 2 6	0 2 6	Apr. 1876
15000	Great Dyllife, c, Montgomeryshire	4 0 0	—	—	19 13 0	0 1 6	Apr. 1876
15000	Great Laxey, c, Isle of Man*	17 1/2	17 17 1/2	—	0 2 0	0 2 0	May 1876
615	Great Retallack, c, Perranabuloe	5 13 6	2	1 1/2 1 1/2	0 2 0	0 2 0	May 1876
25000	Great West Van, c, Cardigan*	41 2 6	—	—	15 19 6	0 2 6	June 1876
5008	Great Wheal Vor, c, t, Helston*	0 6 0	—	—	0 12 0	0 12 0	June 1876
4400	Green Hurth, c, Durham*	0 6 0	—	—	0 6 0	0 6 0	June 1876
20000	Grogwinton, c, Cardigan*	2 0 0	—	—	0 12 0	0 12 0	June 1876
10000	Gunsallake (Clitters), c, t, c	5 5 0	—	—	0 12 0	0 12 0	June 1876
1024	Herodsfoot, c, near Liskeard*	8 10 0	—	—	62 5 0	0 15 0	Oct. 1875
15000	Hingston Down, c, Calstock*	2 5 0	—	—	4 4 0	0 1 0	Nov. 1875
25000	Killalee, c, Tipperary	1 0 0	—	—	572 10 0	1 0 0	Mar. 1876
400	Lisburne, c, Cardiganshire	15 15 0	60	55 60	7 1/2	per cent.	Nov. 1875
14000	Llanidloes, c, t, Montgomery	0 10 0	—	—	0 17 6	0 1 6	Jan. 1876
10000	Lovel, c, Cardigan*	5 0 6	2	1 1/2 2	7 15 0	0 2 0	Jan. 1876
10000	Marke Valley, c, Cardigan*	3 0 0	—	—	0 7 2	0 7 2	Jan. 1876
10000	Melindur Valley, c, Cardigan*	3 0 0	—	—	64 16 0	0 4 0	May 1876
9000	Minera Mining Co., c, Wrexham*	6 0 0	—	—	23 11 6	0 3 6	Jan. 1876
20000	Mining Co. of Ireland, c, t, c	7 0 0	—	—	0 10 0	0 10 0	Dec. 1875
512	North Busy, c, Chacewater	3 9 6	2 1/2	2 1/2	4 13 0	0 3 0	Nov. 1875
12000	North Hensley, c, Wales	2 10 0	—	—	4 13 0	0 12 0	Nov. 1875
2000	North Levant, c, St. Just*	12 2 0	—	—	0 9 0	0 9 0	Sept. 1875
27555	Old Trebargett, c, s, ordinary shares	0 10 0	—	—	0 9 0	0 9 0	Sept. 1875
9258	Old Trebargett, c, s, 10 per cent. pref.	0 10 0	—	—	0 1 4 1/2	0 1 4 1/2	Oct. 1875
5000	Penrhall, c, St. Agnes	3 0 0	—	—	0 13 6	0 13 6	Oct. 1875
45783	Penrithall, c, c, Gwenna*	2 0 0	—	—	0 2 8 0	0 2 8 0	Nov. 1875
6000	Phoenix, c, t, Llanidloes	4 13 4	—	—	39 19 0	0 4 0	Nov. 1875
15000	Prince Patrick, c, t, Holywell	1 0 0	—	—	0 14 0	0 1 3	Jan. 1876
1120	Providence, c, Lelant*	17 18 7	2 1/2	2 1/2	104 12 6	0 10 0	Sept. 1875
12000	Roman Gravel, c, Salop*	7 10 0	15 1/2	14 1/2 15 1/2	6 4 0	0 6 4	May 1876
512	South Caradon, c, St. Cleer*	1 5 0	110	100 108	728 0 0	0 3 0	May 1876
6122	South Conduar, c, t, Camborne*	1 0 0	—	—	1 18 6	0 1 8	Oct. 1875
10000	So. Fr. Patrick, c, t, (5000 sh. issued)	1 0 0	—	—	0 7 0	0 7 0	Oct. 1875
12000	Tankerville, c, t, Salop*	6 0 0	10 1/2	10 10 1/2	4 7 0	0 5 0	May 1876
6000	Tinroft, c, t, Pool, Illogan*	9 0 0	19	17 18	49 8 6	0 5 0	May 1876
15000	Van, c, Llanidloes*	4 5 0	38	37 38	17 9 6	0 16 0	Apr. 1876
3000	W. Chiverton, c, t, Perranabuloe*	12 10 0	18	16 1/2 17 1/2	54 0 0	0 10 0	Apr. 1876
1783	West Police, St. Day	10 0 0	—	—	1 14 0	0 1 4	Feb. 1876
612	West Tolgus, c, Redruth*	55 10 0	69	62 1/2 65	13 10 0	0 1 5	Apr. 1876
5048	West Wheal Vor, c, t, Illogan*	27 3 9	7	6 1/2 7	3 12 0	0 3 0	Oct. 1875
12000	West Wye Valley, c, t, Montgomery	2 0 0	—	—	0 11 6	0 1 1	May 1876
612	Wheal Bassett, c, Illogan*	11 2 6	20	18 1/2 19	638 10 0	1 10 0	May 1876
2048	Wheal Jane, c, t, Ken	2 13 10	1 1/2	1 1/2	5 5 0	0 5 0	Dec. 1875
4298	Wheal Kitty, c, St. Agnes	5 4 8	—	—	11 19 6	0 2 0	Dec. 1875
80	Wheal Owles, c, St. Just*	85 5 0	—	—	522 10 0	0 4 0	Aug. 1875
6000	Wheal Prussia, c, Redruth*	2 0 0	—	—	0 3 0	0 3 0	Dec. 1875
10000	Wicklow, c, s, t, Wicklow	2 10 0	2	1 1/2 2	52 9 0	0 2 6	Mar. 1876
10000	Wye Valley, c, Montgomery*	3 0 0	—	—	0 6 0	0 6 0	Aug. 1875

## FOREIGN DIVIDEND MINES.

35500	Alamillos, <i>i, Spain*</i>	2 0 0	—	2 1/2	—	112 3	0 2 6	Mar. 1876		
20000	Almaden and Tinto Consol., <i>s, t</i>	1 0 0	—	3 1/2	—	0 6 3	0 1 0	May 1876		
20000	Australian, <i>c, South Australia*</i>	7 7 6	—	1 1/2	2	0 15 6	0 2 0	July 1875		
10000	Battle Mountain, <i>c, c, (2400 part pd.)</i>	5 0 0	—	3 1/2	—	10 0	0 10 0	Nov. 1875		
10000	Birdseye Creek, <i>c, California*</i>	4 0 0	—	1 1/2	1 1/4	—	—	June 1876		
12320	Burra Burra, <i>c, c, So. Australia</i>	8 0 0	—	—	—	70 0 0	0 10 0	June 1876		
20000	Cape Copper Mining, <i>t, So. Africa</i>	7 0 0	44	41	43	14 15 0	1 0 0	June 1876		
40000	Cedar Creek, <i>c, California*</i>	5 0 0	—	3 1/2	3 1/2	—	0 5 0	2 6	June 1876	
30000	Central American Association <sup>†</sup>	0 16 8	—	—	—	0 8 0	0 1 0	July 1869		
15000	Chicago, <i>s, Utah*</i>	10 0 0	—	6 1/2	6 6 1/2	—	0 4 0	4 0	May 1876	
21000	Colorado Terrible, <i>s, Colorado*</i>	8 0 0	—	1 1/2	1 1/2	—	0 13 6	0 4 0	Jan. 1875	
10000	Copapo, <i>c, Chile* (20 shares)</i>	16 15 0	—	—	—	7 8 5	0 2 6	Jan. 1876		
60000	Don Pedro North del Rey <sup>†</sup>	0 15 0	—	3 1/2	3 1/2	—	2 5 0	0 2 0	Mar. 1876	
23500	Eberhardt and Aurora, <i>s, Nevada*</i>	18 0 0	—	9 1/2	9 1/2	—	1 0 0	0 1 0	July 1871	
90000	Emma, <i>s, s, Utah</i>	20 0 0	—	3 1/2	3 1/2	—	8 12 0	0 6 0	Dec. 1875	
70000	English and Australian, <i>c, s, Aust.</i>	2 10 0	—	1 1/2	1 1/2	—	2 15 9	0 2 0	Mar. 1876	
15000	Ferguson, <i>c, California*</i>	2 0 0	—	—	—	4 3 0	0 3 0	3 0	April 1872	
80000	Flagstaff, <i>s, Utah*</i>	10 0 0	—	3	1 1/2	2	—	0 20 0	5 0	July 1875
25000	Fortuna, <i>c, Spain*</i>	2 0 0	—	6 1/2	—	—	5 8 10	0 8 0	Mar. 1876	
55000	Frontino & Bolivia, <i>s, New Gran.*</i>	2 0 0	—	2 1/2	2 1/2	—	0 1 0	0 1 0	June 1876	
80000	Gold Run, <i>hyd., New Gran.*</i>	1 0 0	—	3 1/2	3 1/2	—	0 2 4	0 4 0	Oct. 1875	
85000	Kapunda Mining Co. Australia <sup>†</sup>	1 3 0	—	—	—	—	0 14 0	0 8 0	July 1876	
20000	Lead Chance, <i>s, Utah</i>	5 0 0	—	3 1/2	3 1/2	—	0 2 4	0 4 0	Oct. 1875	
15000	Linares, <i>i, Spain*</i>	3 0 0	—	6 1/2	5 1/2	6	15 11 2	0 10 0	Mar. 1876	
85000	London and California, <i>s, t</i>	2 0 0	—	3 1/2	3 1/2	—	0 1 0	0 1 0	July 1875	
7837	Luisitania, Portugal <sup>†</sup> (25 shares)	9 10 0	—	1 1/2	1 1/2	—	0 11 6	0 1 6	Mar. 1873	
5000	Mammoth Copperworks of Utah, <i>c, s</i>	10 0 0	—	—	—	—	0 5 0	0 5 0	Dec. 1872	
5000	Mountain Chief, <i>s, Utah*</i>	10 0 0	—	—	—	—	0 4 0	0 4 0	Jan. 1873	
18000	Prussian Mining & Ironworks, <i>c, i, s</i>	30 0 0	—	—	—	—	6 0 0	8 0 0	0	July 1873
10000	Pontgibaud, <i>s, s, France*</i>	20 0 0	18	16	18	—	2 8 0	2 8 0	2	Nov. 1875
100000	Port Phillip, <i>c, Clunes*</i>	1 0 0	—	3 1/2	3 1/2	—	1 8 0	2 3 0	2	Nov. 1875
54000	Richmond Consols, <i>s, Nevada*</i>	5 0 0	—	8 1/2	8 1/2	8 1/2	2 14 0	0 7 6	Mar. 1876	
40000	Santa Barbara, <i>s, Brazil</i>	0 10 0	—	2	1 1/2	1 1/2	—	0 1 3	0 1 3	Apr. 1876
120000	Scottish Australian Mining Co.*	1 0 0	—	1 1/2	1 1/2	1 1/2	15 per cent.	—	—	May 1876
80000	Scottish Austral. Mining Co. New...	0 5 0	—	3 1/2	3 1/2	—	15 per cent.	—	—	May 1876
112500	Sierra Buttes, <i>c, California*</i>	2 0 0	—	3 1/2	3 1/2	—	1 14 0	0 2 0	Apr. 1876	
60000	South Aurora, <i>c, Nevada*</i>	5 0 0	—	3 1/2	3 1/2	—	0 14 2	0 2 0	Nov. 1873	
253000	St. John del Rey <sup>†</sup> (45 shares and multiples dealt in)	260 380	—	—	—	—	3 1/2	25 per cent.	—	Dec. 1875
15000	Sweetland Creek, <i>c, California*</i>	4 0 0	—	3 1/2	3 1/2	—	2 6 7	0 3 3	Apr. 1876	
20000	Tollima, <i>s, s, New America</i>	5 0 0	—	3 1/2	3 1/2	—	0 11 6	0 6 6	4	May 1876
15000	Western Andes, <i>s, s, New Granada</i>	5 0 0	—	—	—	—	2 6 7	0 3 3	Apr. 1876	

## NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Div.	Last Pr.	Clos. Pr.	Last Call.
20000	Anglo-Australian, g, Victoria*	2 10 0	—	—	Sept. 1872
5000	Anguilla Phosphate, West Indies (4000 issued)	10 0 0	—	—	Fully pd.
10000	Argentine, g, Argentine Republic	5 0 0	—	—	Fully pd.
10000	Australian Central, g, (also 5000 deferred shares)	6 1/2 0	6 1/2	—	Fully pd.
3000	Bellavista, s, Peru* (£10 shares)	10 0 0	—	—	Fully pd.
3000	Blue Tent, Syd., California	5 0 0	—	—	Fully pd.
5000	Braganza, g, Brazil*†	0 15 0	3 1/2	2 3/4	Fully pd.
12000	Camp Floyd, s, Utah*	10 0 0	—	—	Oct. 1871
35000	Cesena Sulphur Company, Romanga, Italy*	10 0 0	—	—	Fully pd.
50152	Chontales, g, s, Nicaragua*† (and 12,542 of £1 15s.)	2 0 0	—	—	Fully pd.
6000	Clifton, c, Chile*	5 0 0	3/4	3/4 3/4	Fully pd.
15000	Condes c, Chili, s	5 0 0	—	—	Feb. 1872
10000	Crescent, g, Plumas County, California*	10 0 0	6 1/2	6 1/2	Fully pd.
85000	Excelsior Hydraulic Gold Washing Co., California*	6 0 0	—	—	Fully pd.
100000	Exchequer, g, s, California*	1 0 0	—	—	Dec. 1871
40000	Holcombe Valley, g, s, California*	1 0 0	1 1/2	1 1/2 2/4	Fully pd.
40000	Hornachos,* s/s, (£10 shares) Spain	10 0 0	18	—	July 1873
30000	Imperial Brazilian Collieries, Brazil*	5 0 0	—	16 18	Jan. 1874
10000	I. X. L., g, s, California*	1 0 0	—	—	Fully pd.
5000	Javali, g, Nicaragua*	1 0 0	1 1/2	1 1/4	Fully pd.
12000	Lanestosa, g, s, Viscaya, Spain (£2 shares)	2 0 0	3/4	3/4 3/4	Fully pd.
75000	Malabar, g, Colombia* (45000 issued)	1 15 0	—	—	Mar. 1873
40000	Malpaso, g, Colombia* (10000 pref. shares, fully paid)	1 0 0	—	—	Fully pd.
12000	Menzenberg, c, Honnet, Germany	5 0 0	—	—	Fully pd.
6000	Monte Loreto, c, c, Italy*	5 0 0	—	—	Fully pd.
80000	New Quebrada, c, Venezuela*	5 0 0	—	—	Fully pd.
50000	New Rosario, s, Mexico*	1 0 0	4 1/2	3 1/2 3/4	Fully pd.
3000	New Zealand Kapanga, g, Coromandel*	5 0 0	3/4	3/4 3/4	Fully pd.
5000	Oregon, U.S. (preference shares)	4 0 0	4 1/2	4 1/2	Sept. 1875
50000	Panulillo, c, Chile* (50000 debentures)	4 0 0	2 1/2	2 1/2	Fully pd.
8000	Pastorena United, g, Italy*	4 0 0	3/4	3/4 3/4	Fully pd.
5000	Rica, g, Colombia* (40000 issued)	3 0 0	3/4	3/4 3/4	Fully pd.
2,131,000	Rio Tinto, c, s, Huelva, Spain	1 0 0	—	—	Fully pd.
1,800,000	Rosa Grande, g, Brazil*† (£1 shares)	Stock	60	58 60	Fully pd.
20000	Russia Copper, Orenburg and Ufa*†	0 19 0	3 1/2	3 1/2	July 1872
25000	San Pedro, c, Chili*	2 0 0	3	2 1/2 3	Fully pd.
10000	Silver Plume, s, Colorado*	1 0 0	2	1 1/2 1 1/2	Fully pd.
37500	Snowdrift, c, Colorado*	1 0 0	—	—	Fully pd.
20000	Tecoma, s, Utah*	2 0 0	—	—	Fully pd.
20000	Thornhill Reef, g, Australia*	10 0 0	3/4	3/4 3/4	Fully pd.
43174	United Mexican, s, Mexico*†	1 0 0	3/4	3/4 3/4	Fully pd.
14000	Utah, g, s/s, Utah*	29 15 3	2 1/2	1 1/4 2 1/4	May 1875
25000	Victoria (London)*, g, Australia (25,000 sh. 16s.)	5 0 0	—	—	Fully pd.
75000	Yorke Peninsula, c, South Australia	1 0 0	1 1/2	—	Fully pd.
40000	Yorke Peninsula, c, South Australia Preference	1 0 0	1	3/4 3/4	Fully pd.

\* Have made calls since last dividend was paid.